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THE PRODUCTION AND CONSUMPTION OF DAIRY PRODUCTS.

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INTRODUCTION.

The changes in the geographic distribution of the population, in the centers of agricultural production, and in the methods of transportation have had marked influence on the localization of the dairy industry. In early days the dairyman supplied demands within a restricted area, but the development of railroads and refrigeration has had considerable effect on the character of the dairy industry and its localization. As a part of the agriculture of our country, dairying has had to compete with other types of farming. Since the products of the dairy may be consumed in the form of milk, butter, or cheese, there is a competition among them as to what form the consumption will take. It is the purpose of this bulletin to call attention to the influence of the various factors mentioned above.

PRODUCTION OF DAIRY PRODUCTS.

THE GENERAL SITUATION.

In the last 40 years great changes have taken place in population, in agriculture, and in the various phases of the dairy industry of the United States. In 1870 the total population of the United States was 38,600,000. By 1900 it had nearly doubled and by 1910 lacked a little of being 92,000,000. The number of dairy cows had increased from 9,000,000 in 1870 to nearly 21,000,000 in 1910. The rate of increase for improved land was even greater than that of the population or the dairy cows; in 1870 there were 190,000,000 acres, and in 1910, 480,000,000. The increase in the total butter production had been even more marked, from 514,000,000 in 1870 to nearly three times that amount, or approximately 1,620,000,000 pounds, in 1910. Cheese production, however, did not even double; the increase was from 163,000,000 to 321,000,000 pounds. There have been marked variations in the rates of increase and the relative importance of the

NOTE.—This bulletin outlines the changes in the geographic distribution of the dairy industry and gives information concerning the consumption of dairy products on farms and in cities. It is of special interest to those engaged in any phase of dairying or in the distribution of dairy products.

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TABLE 1.—*Population, improved land, dairy cows, and production of butter and cheese, by geographic divisions for 1870, 1880, 1890, 1900, and 1910.*

Year and geographic division.[1]	Population.	Number of dairy cows.	Improved land.	Production for calendar year preceding date of census.	
				Butter.	Cheese.
1910.			*Acres.*	*Pounds.*	*Pounds.*
New England	6,552,681	841,698	7,254,904	68,699,379	3,676,609
Middle Atlantic	19,315,892	2,597,652	29,320,894	165,392,518	118,339,484
East North Central	18,250,621	4,829,527	88,947,228	424,137,997	180,423,449
West North Central	11,637,921	5,327,606	164,284,862	444,724,204	5,286,968
South Atlantic	12,194,895	1,810,754	48,479,733	125,256,293	514,137
East South Central	8,409,901	1,628,061	43,946,846	136,791,873	93,971
West South Central	8,784,534	2,249,553	58,264,273	134,876,201	441,697
Mountain	2,633,517	514,466	15,915,002	34,756,687	2,546,935
Pacific	4,192,304	826,115	22,038,008	84,780,111	9,208,931
Total, United States	91,972,266	20,625,432	478,451,750	1,619,415,263	320,532,181
1900.					
New England	5,592,017	893,478	8,134,403	92,032,196	6,958,700
Middle Atlantic	15,454,678	2,602,788	30,786,211	233,986,350	141,259,571
East North Central	15,985,581	3,962,481	86,670,271	403,208,930	120,279,089
West North Central	10,347,423	4,527,803	135,643,828	407,632,767	13,667,004
South Atlantic	10,443,480	1,383,319	46,100,226	92,883,312	593,308
East South Central	7,547,757	1,264,282	40,237,337	97,999,645	181,528
West South Central	6,532,290	1,634,954	39,770,530	88,856,542	473,381
Mountain	1,674,657	329,604	8,402,576	20,499,029	4,709,314
Pacific	2,416,692	536,924	18,753,105	54,653,831	10,222,744
Total, United States	75,994,575	17,135,633	414,498,487	1,491,752,602	298,344,639
1890.					
New England	4,700,749	822,001	10,738,930	77,240,024	9,107,032
Middle Atlantic	12,706,220	2,529,060	31,599,094	217,283,692	130,131,662
East North Central	13,478,305	3,752,237	78,774,647	327,051,265	93,779,808
West North Central	8,932,112	4,488,762	105,517,479	323,491,323	16,446,053
South Atlantic	8,857,922	1,369,466	41,677,371	80,401,070	615,291
East South Central	6,429,154	1,912,074	35,729,170	84,955,855	177,070
West South Central	4,740,983	1,517,583	30,559,654	50,347,087	172,597
Mountain	1,213,935	218,689	5,460,739	8,709,349	739,976
Pacific	1,888,334	502,078	17,559,671	35,456,941	5,779,894
Total, United States	62,947,714	16,511,950	357,616,755	1,205,446,606	256,749,383
1880.					
New England	4,010,529	746,656	13,148,466	65,934,782	12,202,042
Middle Atlantic	10,496,878	2,444,089	33,237,166	211,073,290	138,700,187
East North Central	11,206,668	2,990,852	75,589,373	240,351,236	78,950,611
West North Central	6,157,443	2,411,229	61,252,946	143,103,863	7,581,959
South Atlantic	7,597,197	1,280,761	36,170,331	48,703,330	640,065
East South Central	5,585,151	1,145,403	30,820,882	51,603,349	184,538
West South Central	3,334,220	1,002,037	18,985,889	22,605,422	92,385
Mountain	653,119	124,844	2,213,300	3,205,759	606,392
Pacific	1,114,578	297,249	13,352,689	20,091,040	4,199,671
Total, United States	50,155,783	12,443,120	284,771,042	806,672,071	243,157,850
1870.					
New England	3,487,924	642,593	11,997,540	49,662,325	16,316,016
Middle Atlantic	8,810,806	2,190,429	29,119,645	176,248,193	104,047,024
East North Central	9,124,517	2,247,683	54,899,646	156,138,383	35,889,749
West North Central	3,856,594	1,046,324	23,509,863	58,262,042	2,151,998
South Atlantic	5,853,610	1,001,094	30,202,991	28,575,306	252,190
East South Central	4,404,445	835,351	24,218,478	27,273,321	509,290
West South Central	2,029,965	659,083	6,870,297	6,789,083	48,208
Mountain	315,385	83,419	576,200	1,348,607	181,035
Pacific	675,125	229,356	7,526,439	9,795,423	3,531,872
Total, United States	38,558,371	8,935,332	188,921,099	514,092,683	162,927,382

[1] The geographic divisions are as follows: *New England:* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; *Middle Atlantic:* New York, New Jersey, and Pennsylvania; *East North Central:* Ohio, Indiana, Illinois, Michigan, and Wisconsin; *West North Central:* Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas; *South Atlantic:* Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida; *East South Central:* Kentucky, Tennessee, Alabama, and Mississippi; *West South Central:* Arkansas, Louisiana, Oklahoma, and Texas; *Mountain:* Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada; *Pacific:* Washington, Oregon, and California.

New England and Middle Atlantic divisions combined comprise the North Atlantic geographic division and the Mountain and Pacific divisions, the Western.

various geographic divisions in the production of cheese, but these are more easily comprehended by a study of the percentages in Table 3 than by a study of the figures showing production in pounds, as in Table 1.

CHANGES SINCE 1870.

If 1870 is taken as 100, and figures for other census years are expressed as percentages of the corresponding figures for 1870, the changes in the various geographic divisions for the different items mentioned above can be readily comprehended. For the United States, as a whole, the percentage or "index number" for 1910 for improved land is slightly greater than the index numbers for population and for dairy cows. This condition is true for practically all the census years shown for the United States as a whole; but when geographic divisions are considered individually the increase for those east of the Mississippi has not been as rapid as the increase for those west of that river, due primarily to the undeveloped condition of the West prior to 1870 and to its great development since.

There was less improved land in the New England States in 1910 than there was in 1870, while in the Middle Atlantic States the areas of improved farm land in 1870 and 1910 were approximately the same. The increase in dairy cows in the 40 years was slight in the New England and the Middle Atlantic States, yet the increase in the total population in the New England States was about 90 per cent, and in the Middle Atlantic nearly 120 per cent. When the increase in butter and cheese production in the New England and Middle Atlantic States is compared with the increase in total population, the population shows the more rapid advance. In other words, neither agriculture in general nor the dairy industry has kept up with the increase in population in these two geographic divisions.

When similar comparisons are made for the North Central States east of the Mississippi River, the increase in improved land is not as large as the increase in population, yet the increase in dairy cows and in dairy products has excelled the increase in population.

In the South Atlantic, East South Central, and Pacific States the population has increased faster than the improved land in the 40 years under consideration, and the same is true of the dairy cows, except in the East South Central States; yet increase in butter production was greater in all three of the geographic divisions than that for the population. Other changes can readily be noted in Table 2.

TABLE 2.—*Population, improved land, dairy cows, and production of butter and cheese, by geographic divisions, for 1880, 1890, 1900, and 1910, expressed as percentages of 1870.*

[1870=100 per cent.]

Year and geographic division.	Population.	Dairy cows.	Improved land.	Production for calendar year preceding date of census.	
				Butter.	Cheese.
1910.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
New England	187.9	131.0	60.5	138.3	22.5
Middle Atlantic	219.2	118.6	100.7	93.8	113.7
East North Central	200.0	214.9	162.0	271.6	502.7
West North Central	301.8	509.2	698.8	763.3	245.7
South Atlantic	208.3	180.9	160.5	438.3	203.9
East South Central	190.9	194.9	181.5	501.6	18.5
West South Central	432.7	341.3	848.1	1,986.7	916.2
Mountain	835.0	616.7	2,762.1	2,577.2	1,406.9
Pacific	621.0	360.2	292.8	865.5	260.7
Total, United States	238.5	230.8	253.3	315.0	196.7
1900.					
New England	160.3	139.0	67.8	185.3	42.6
Middle Atlantic	175.4	118.8	105.7	132.8	135.8
East North Central	175.2	176.3	157.9	258.2	335.1
West North Central	268.3	432.7	577.0	699.7	635.1
South Atlantic	178.4	138.2	152.6	325.0	235.3
East South Central	171.4	151.3	166.1	359.3	35.6
West South Central	321.8	248.1	578.9	1,308.8	982.0
Mountain	531.0	395.1	1,458.3	1,520.0	2,601.3
Pacific	358.0	234.1	249.2	558.0	289.4
Total, United States	197.1	191.8	219.4	290.2	183.1
1890.					
New England	134.8	127.9	89.5	155.5	55.8
Middle Atlantic	144.2	115.5	108.5	123.6	125.1
East North Central	147.7	166.9	143.5	209.5	261.3
West North Central	231.6	429.0	448.8	555.2	764.2
South Atlantic	151.3	136.8	138.0	281.4	164.7
East South Central	146.0	157.1	147.5	311.5	34.8
West South Central	233.5	230.3	444.8	741.6	358.0
Mountain	384.9	262.2	947.7	645.8	408.7
Pacific	279.7	218.9	233.3	362.0	163.6
Total, United States	163.3	184.8	189.3	234.5	157.6
1880.					
New England	115.0	116.2	109.6	132.8	74.8
Middle Atlantic	119.1	111.6	114.1	119.8	133.3
East North Central	122.8	133.1	137.7	153.9	220.0
West North Central	159.7	230.4	260.5	245.6	352.3
South Atlantic	129.8	127.9	119.8	170.4	253.8
East South Central	126.8	137.1	127.3	189.2	36.2
West South Central	164.2	152.0	276.3	333.0	191.6
Mountain	207.1	149.7	384.1	237.7	335.0
Pacific	165.1	129.6	1/7.4	205.1	118.9
Total, United States	130.1	139.3	150.7	156.9	149.2

CONDITIONS IN DIFFERENT GEOGRAPHIC DIVISIONS.

The variations in the changes of the various elements connected with dairying have had marked influence upon the relative importance of this industry in the different geographic divisions. In 1870 the New England States had 6.4 per cent of the total improved land of the United States, while in 1910 they had only 1.5 per cent. Similar percentages for population were 9 and 7.1, respectively, and for dairy cows 7.2 and 4.1 per cent, of the totals for the United States. For the Middle Atlantic States the changes in the percentages for population have been but slight, while the per cent for improved land had decreased in 1910 to less than half of what it was in 1870, and the per cent of dairy cows decreased nearly one-half. The most marked changes for the East North Central States

have taken place in the improved land, the percentages (computed on the basis of United States totals) decreasing from 29.1 to 18.6, while the changes for population and dairy cows have been but slight. The changes in the population percentages for New England, Middle Atlantic, and East North Central States have been small, yet there has been a marked change in the relative importance of the agriculture and the dairy industry.

TABLE 3.—*Relative importance of the geographic divisions as to population, dairy cows, improved land, butter, and cheese, expressed as percentages of total United States, 1870–1910.*

[In each year shown below, total for United States=100 per cent.]

Year and geographic division.	Population.	Number of dairy cows.	Area of improved land.	For calendar year preceding date of census.	
				Butter production.	Cheese production.
1910.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
New England	7.1	4.1	1.5	4.2	1.1
Middle Atlantic	21.0	12.6	6.1	10.2	36.9
East North Central	19.8	23.4	18.6	26.2	56.3
West North Central	12.7	25.8	34.4	27.5	1.7
South Atlantic	13.3	8.8	10.1	7.7	.2
East South Central	9.1	7.9	9.2	8.5	(1)
West South Central	9.5	10.9	12.2	8.3	.1
Mountain	2.9	2.5	3.3	2.2	.8
Pacific	4.6	4.0	4.6	5.2	2.9
Total, United States	100.0	100.0	100.0	100.0	100.0
1900.					
New England	7.4	5.2	2.0	6.2	2.3
Middle Atlantic	20.3	15.2	7.5	15.7	47.3
East North Central	21.0	23.1	20.9	27.0	40.3
West North Central	13.6	26.4	32.7	27.3	4.6
South Atlantic	13.8	8.1	11.1	6.2	.2
East South Central	9.9	7.4	9.7	6.6	.1
West South Central	8.6	9.6	9.6	5.9	.2
Mountain	2.2	1.9	2.0	1.4	1.6
Pacific	3.2	3.1	4.5	3.7	3.4
Total, United States	100.0	100.0	100.0	100.0	100.0
1890.					
New England	7.5	5.0	3.0	6.4	3.5
Middle Atlantic	20.2	15.3	8.8	18.1	50.7
East North Central	21.4	22.7	22.0	27.1	36.5
West North Central	14.2	27.2	29.5	26.8	6.4
South Atlantic	14.1	8.3	11.7	6.7	.2
East South Central	10.2	8.0	10.0	7.1	.1
West South Central	7.5	9.2	8.6	4.2	.1
Mountain	1.9	1.3	1.5	.7	.3
Pacific	3.0	3.0	4.9	2.9	2.2
Total, United States	100.0	100.0	100.0	100.0	100.0
1880.					
New England	8.0	6.0	4.6	8.2	5.0
Middle Atlantic	20.9	19.6	11.7	26.2	57.0
East North Central	22.3	24.0	26.5	29.8	32.5
West North Central	12.3	19.4	21.5	17.7	3.1
South Atlantic	15.2	10.3	12.7	6.0	.3
East South Central	11.1	9.2	10.8	6.4	.1
West South Central	6.7	8.1	6.7	2.8	(1)
Mountain	1.3	1.0	.8	.4	.3
Pacific	2.2	2.4	4.7	2.5	1.7
Total, United States	100.0	100.0	100.0	100.0	100.0
1870.					
New England	9.0	7.2	6.4	9.7	10.0
Middle Atlantic	22.9	24.5	15.4	34.3	63.9
East North Central	23.7	25.2	29.1	30.4	22.0
West North Central	10.0	11.7	12.4	11.3	1.3
South Atlantic	15.2	11.2	16.0	5.5	.2
East South Central	11.4	9.3	12.8	5.3	.3
West South Central	5.3	7.4	3.6	1.3	(1)
Mountain	.8	.9	.3	.3	.1
Pacific	1.7	2.6	4.0	1.9	2.2
Total, United States	100.0	100.0	100.0	100.0	100.0

[1] Less than 0.05 of 1 per cent.

RELATION OF IMPROVED LAND TO POPULATION.

By comparing the improved land with the population we get somewhat of a measure of available food in each geographic division. For the United States as a whole there was 0.3 of an acre more per person in 1910 than in 1870, but nearly 0.5 of an acre less than in 1880. For the last three censuses the number has been growing smaller. The number of acres of improved land per person in New England was nearly 3.5 in 1870, but in 1910 it was slightly over 1.1. For the Middle Atlantic States it had decreased from 3.3 to 1.5 acres. The decrease in the East North Central States began in 1880 and in the South Atlantic in 1870. The West North Central States comprise the only group showing an increased number of acres per person for every census since 1870.

RELATION OF DAIRY COWS TO POPULATION.

The number of dairy cows per 1,000 persons gives us a rough estimate of the available supply of dairy products, but since there is such a marked variation in the average yield of milk per cow it is only an approximate measure. For the United States, as a whole, the changes between 1870 and 1910 have been but slight, amounting to 7 cows per 1,000 persons. The maximum number was reached in 1890. However, the maximum number of cows in the New England States was in 1880, and in the Middle Atlantic and Pacific in 1870. The number in the other geographic divisions has not shown a steady tendency in any one direction.

In considering the changes in dairy cows, it must be realized that the census definition, the conception of what comprised dairy cows, and the age at which they began to be included as such varied with the different censuses.

TABLE 4.—*Number of dairy cows per 1,000 population, by geographic divisions.*

Geographic division.	Number of dairy cows per 1,000 population.				
	1910	1900	1890	1880	1870
New England	128.5	159.8	174.9	186.2	184.2
Middle Atlantic	134.5	168.4	199.0	232.8	248.6
East North Central	264.6	247.9	278.4	266.9	246.3
West North Central	457.8	437.6	502.5	391.6	271.3
South Atlantic	148.5	132.5	154.6	168.6	171.0
East South Central	193.6	167.5	204.1	205.1	189.7
West South Central	256.1	250.3	320.1	300.5	324.7
Mountain	195.4	196.8	180.1	191.2	264.8
Pacific	197.1	222.2	265.9	266.6	339.8
Total, United States	224.3	225.5	262.3	248.1	231 7

PER CAPITA PRODUCTION OF BUTTER AND CHEESE.

For the United States, as a whole, in 1910, the amount of butter produced per capita was greater than in 1870 and in 1880, but in 1890 and 1900 the average production per capita was 2 pounds less

than in 1910. In the Southern and Western States the general tendency is for the per capita production to increase, while in the New England and Middle Atlantic States the average is decreasing. There are several factors entering into these changes. The principal ones being changes in population, in dairy cows, in average yields of milk per cow, and in the relative proportion of the total production used for making butter. Changes in the average yield of milk and the relative amounts of milk used raw for human consumption will be discussed later. If the average production per capita for the United States represents the actual average consumption in all the geographic divisions, an average greater or smaller than this amount would represent a surplus or deficit. Using this basis, the New England and Middle Atlantic States began to have a deficit of butter in 1890. The North Central and Pacific States have always had a surplus.

TABLE 5.—*Average production of butter and cheese per capita, by geographic divisions.*

Geographic division.	1910	1900	1890	1880	1870
BUTTER.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
New England	10.5	16.5	16.4	16.4	14.2
Middle Atlantic	8.6	15.1	17.1	20.1	20.0
East North Central	23.2	25.2	24.3	21.4	17.1
West North Central	38.2	39.3	36.2	23.2	15.1
South Atlantic	10.3	8.9	9.1	6.4	4.9
East South Central	16.3	13.0	13.2	9.2	6.2
West South Central	15.4	13.6	10.6	6.8	3.3
Mountain	13.2	12.2	7.2	4.9	4.3
Pacific	20.2	22.6	18.8	18.0	14.5
Total, United States	17.6	19.6	19.1	16.1	13.3
CHEESE.					
New England	0.6	1.2	1.9	3.0	4.7
Middle Atlantic	6.1	9.1	10.2	13.2	11.8
East North Central	9.9	7.5	7.0	7.0	3.9
West North Central	.5	1.3	1.8	1.2	.6
South Atlantic	[1]	.1	[1]	.1	[1]
East South Central	[1]	[1]	[1]	[1]	.1
West South Central	.1	.1	[1]	[1]	[1]
Mountain	1.0	2.8	.6	.9	.6
Pacific	2.2	4.2	3.1	3.8	5.2
Total, United States	3.5	3.9	4.1	4.8	4.2

[1] Less than 0.05 of 1 per cent.

The cheese production has always been highly localized in the Middle Atlantic and East North Central States. In the Middle Atlantic States the per capita production is decreasing, while the reverse is true for the East North Central. By comparing the number of acres of improved land with the dairy cows, an approximate index of the relative importance of dairy farming can be obtained. The smaller the number of acres per cow, the more important seems dairying in the system of agriculture. In the North Atlantic, East North Central,

and Pacific States the number of acres per dairy cow is decreasing; in other words, dairy farming is becoming more important as an agricultural industry. In the West South Central and Mountain States, other types of farming increase faster than dairying.

PRODUCTION OF BUTTER PER COW.

During the last 40 years the average quantity of butter produced per cow has increased 30 pounds. This fact must not be taken as a measure of the increase of the productivity of dairy cows, for the relative quantity of the total milk production used for cheese, or consumed raw, may have varied considerably. In the New England and Middle Atlantic States the production of butter, compared with the total number of dairy cows, was lower in 1910 than in any census year since 1870. This indicates that a larger quantity of the milk produced is being used for other purposes. Another interesting fact is that in all of the southern and western States the average production per cow is increasing. For cheese, the average production in the East North Central States has been increasing, while in the Middle Atlantic the tendency is toward a decline.

The average yields of milk per cow, as obtained from the last three censuses, have been obtained by somewhat different methods, so that comparison of one census with another can not be made with any degree of accuracy. One fact, however, appears in all three—that is, the average production in the New England, Middle Atlantic, and East North Central is much larger than that of the Southern States. It also seems that the production in the Pacific and Mountain States is increasing.

FACTORY PRODUCTION OF BUTTER AND CHEESE.

Not only have there been marked changes in the yield of butter and cheese and milk per cow and per person, but in the last 40 years cheese manufacture has changed from a farm operation to a factory system. Butter production is rapidly moving in the same direction. In 1870, 33 per cent of the total cheese made in the United States was produced on farms; and in 1910, only 3 per cent. In 1870 all the butter was produced on farms, but in 1910 only a little over 60 per cent. It can readily be realized what a change the introduction of the factory system has made in the dairy industry. These changes have taken place where the dairy industry is most intense. There has not been developed to any great extent in the United States a method whereby the factory system of making butter and cheese can be carried on where the number of cows is small.

URBAN POPULATION AND DEMAND FOR MARKET MILK.

In 1910 there were 50 cities of 100,000 inhabitants or more, of which 19 were in the North Atlantic States and 15 in the North Central States. Of the cities which had 2,500 inhabitants or more, 861 out of a total of 2,405 were in the North Atlantic States and 805 in the North Central States.

This calls attention to the fact that the demand for market milk is greater in these two geographic divisions. Looking at the same fact from another point of view, in the New England States 5 out of 6 persons live in cities of 2,500 inhabitants or more. In the Middle Atlantic, 7 out of 10; in the East North Central, 1 out of 2, and in the West North Central, 1 out of 3. These ratios call attention to the demand that there must be for market milk.

It should also be remembered that there are a large number of farms in the United States where no dairy cows are kept, and there are also a large number of people living in cities or small towns of less than 2,500 inhabitants. A larger percentage of the farms of the North Atlantic and North Central States report dairy cows than the other geographic divisions. In the South the percentage of farms reporting dairy cows and the average number of cows per farm is small.

In 1900 and 1910 the census gave data from which the quantity of dairy products not sold off farms could be obtained. From these data it is estimated that 58 per cent of the milk produced in 1910 was used to make factory butter and cheese, or for other uses off of the farm. A similar percentage for 1900 was 69. Of all the butter and cheese made on farms a decreasing percentage was sold; that is, the production of butter and cheese on farms is primarily for home consumption. These changes were more marked in the North Atlantic, East North Central, and Pacific States than in the other geographic divisions. This calls attention to the point made above, that the manufacture of dairy products on farms is decreasing most rapidly where the dairy industry is most important.

DISPOSAL OF DAIRY PRODUCTS.

CHARACTERISTICS OF DIFFERENT REGIONS.

In the North Atlantic, North Central, and Pacific States dairying is carried on primarily for the sale of milk rather than for the manufacture of butter on the farm. In the New England and Middle Atlantic States it is generally sold as market milk; while in the North Central States most of it is sold on the basis of its butter-fat content, the greater part of it going to butter and cheese factories.

In 1910 the census returns show the number of farms reporting dairy products as well as the number reporting sales. Thus it is possible to compute the average production as well as the average sales per farm. Such a computation brings out in a striking manner the fact that the average quantity of milk sold per farm of those reporting sales was larger than the average quantity produced per farm of those farms reporting production. This is because the large dairy farms that sell milk constitute a large proportion of those upon whose reports the average sales are computed, while average production is based upon all farms reporting milk production. A similar comparison for butter brings out the fact that the average production for farms showing butter production is larger than the average sale for farms reporting sales; that is, farms of both small and large production sell butter, whereas the farms selling milk consist in large proportion of farms of large production.

DAIRY PRODUCE AS A PRINCIPAL SOURCE OF INCOME.

In 1900, farms were classified according to the principal sources of income. The average number of cows per farm which reported that the principal income was from dairy products ranged from 12 per farm in the Pacific and Middle Atlantic States to less than 5 in the East North Central.

FARM CONSUMPTION OF BUTTER.

If we take the total quantity of butter reported as produced on farms and subtract from it the quantity reported as sold, we have practically the amount of butter consumed on farms. By this method it is estimated that both in 1900 and 1910 the annual consumption averaged 153 pounds per farm. Whether this is the actual average or not can not be proved, but it differs considerably from a similar average obtained by another method which will be shown later in the bulletin.

CONSUMPTION OF MILK IN NEW YORK CITY.

One of the largest factors in determining the consumption of milk after it leaves the farm is the number of people living in cities and towns. In order that a clear conception may be obtained of the influence of market milk upon butter and cheese production, a study of the milk supply of several large cities might be of interest. Prior to 1842 practically all of the milk consumed in New York City was brought by wagons from the surrounding counties. In 1842, when the Erie Railroad was under construction, one of the New York City milkmen began to ship milk from Orange County. This milk proved to be of such good quality that the traffic spread rapidly. In a few years the Harlem division of the New York Central began to haul milk from the counties on the west bank of the Hudson River. At

the same time the Newburgh, Dutchess, and Connecticut branch of the Central New England was shipping milk to New York City over the Hudson River branch of the New York Central. A few years later the New York, New Haven & Hartford was bringing milk from the New England States to supply the New York market. In 1870 the Delaware, Lackawanna & Western received small consignments of milk on its Sussex branch in New Jersey, and in the same year the New York, Ontario & Western started its first milk train from Bloomingburg, N. Y. Practically all of the railroads had their farthest point from New York within the 100-mile limit, except that the Harlem was bringing milk from Rutland, Vt., a distance of 240 miles. There was very little change in the areas from which milk was obtained until 1890. In that year the New York, Ontario & Western extended its service to Walton, N. Y., a distance of 179 miles. Shortly after 1890 several other railroads started milk trains. The Lehigh Valley established this service with Dryden, N. Y., as a terminus. In 1893 the Delaware & Hudson was receiving milk and forwarding it to New York City over the Delaware, Lackawanna & Western. In 1890 the West Shore extended its service beyond Albany, with Syracuse as a starting point, and two years later the Hudson River branch of the New York Central extended its service to the same point. By 1910 many of the points from which milk was shipped to New York City were over 300 miles distant. There were no new railroads to enter this service, but those already carrying milk had extended their lines so that it was bounded by the Canadian boundary line on the north and within a short distance of Buffalo on the west.

TABLE 6.—*Number of gallons of milk and cream received at New York City (cream not reduced to terms of milk).*

Year.	New York Central R. R.				Delaware, Lackawanna & Western R. R.	Erie R. R.	New York, Ontario & Western R. R.	Lehigh Valley R. R.
	N. Y. Central (long haul).	Harlem.	New York & Northern.	Total.				
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
1900	11,279,010	5,981,770	1,304,050	18,564,830	16,749,980	16,703,010	16,158,900	5,836,290
1901	14,191,800	5,933,620	1,134,580	21,260,000	16,525,320	17,943,170	16,610,600	6,458,920
1902	17,502,640	5,565,960	1,194,710	24,263,310	17,104,600	17,320,590	18,368,410	7,102,310
1903	18,682,620	5,409,170	1,241,070	25,332,860	18,409,950	18,837,990	19,165,470	7,964,170
1904	21,195,240	4,409,180	801,930	26,406,350	20,575,930	20,226,180	21,123,670	8,615,550
1905	24,358,300	3,364,700	.....	27,723,000	22,993,070	21,302,910	21,030,110	10,881,080
1906	30,193,520	2,465,050	.....	32,658,570	25,155,000	22,123,440	22,212,770	13,017,580
1907	33,578,340	3,374,540	.....	36,952,880	25,892,470	24,261,590	22,682,530	14,029,270
1908	33,204,810	6,038,070	.....	39,242,880	25,991,090	26,106,260	21,282,670	14,033,880
1909	36,285,920	7,607,520	.....	43,893,440	26,464,030	24,330,300	23,706,770	14,466,650
1910	40,570,380	10,777,580	.....	51,347,960	27,776,360	24,133,760	23,283,530	15,604,570
1911	44,584,190	11,190,430	.....	55,774,620	28,732,850	26,312,810	22,943,150	17,606,580
1912	44,832,700	12,051,120	.....	56,883,820	30,693,750	27,004,950	24,953,260	18,216,220
Average:								
1885–1889	.....	.....	.....	14,074,436	2,104,362	15,029,436	6,048,940	.....
1890–1894	.....	8,566,666	3,718,802	12,285,468	12,007,956	16,998,694	9,926,792	529,794
1895–1899	705,592	7,829,584	1,541,072	10,076,248	19,975,436	15,942,236	14,650,162	3,075,194
1900–1904	16,570,262	5,459,940	1,135,268	23,165,470	17,873,156	18,206,188	18,285,410	7,195,448
1905–1909	31,524,178	4,569,976	.....	36,094,154	25,299,132	23,624,900	22,182,970	13,285,692

TABLE 6.—*Number of gallons of milk and cream received at New York City (cream not reduced to terms of milk)*—Continued.

Year.	West Shore R. R.	New York, Susquehanna & Western R. R.	New York, New Haven & Hartford R. R.	Ramsdell Boat Line.	Central R. R. of New Jersey.	Long Island R. R.	Other sources.	Total.
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*	*Gallons.*
1900	6,428,330	7,562,400	4,000,580	3,018,910	903,690	.....	2,190,000	98,116,920
1901	6,399,280	7,400,910	4,161,560	2,380,030	752,440	.....	2,199,460	102,091,690
1902	6,401,050	7,273,030	4,022,210	2,274,530	590,900	.....	2,190,000	106,910,940
1903	7,146,940	7,686,200	4,327,370	2,591,480	601,440	.....	2,190,000	114,253,870
1904	7,675,950	7,887,610	4,845,820	2,172,890	658,480	.....	2,196,000	122,384,430
1905	9,016,790	7,690,230	4,950,650	2,192,930	626,510	.....	2,190,000	130,597,280
1906	9,506,040	8,096,880	6,718,760	2,595,600	830,850	.....	2,190,000	145,105,490
1907	8,387,060	8,010,240	6,189,850	1,588,720	420,180	.....	2,196,000	150,610,790
1908	7,957,190	7,490,820	6,006,120	1,309,380	171,640	.....	2,380,000	151,971,930
1909	7,722,380	7,297,820	6,188,780	1,000,880	.....	.....	2,555,000	157,626,050
1910	8,047,520	7,348,910	6,303,250	957,930	.....	.....	2,555,000	167,358,790
1911	7,492,780	7,310,450	6,746,970	1,034,750	.....	.....	2,555,000	176,509,960
1912	7,971,610	7,180,420	5,619,700	1,147,880	.....	.....	2,562,000	182,233,610
Average:								
1885–1889	2,974,892	5,087,000	3,911,264	1,503,784	1,772,282	1,519,776	3,302,650	57,328,822
1890–1894	5,146,400	5,862,474	2,402,730	2,667,980	1,038,752	1,106,110	2,373,150	72,346,300
1895–1899	6,376,398	6,991,500	4,193,730	2,550,890	953,214	282,016	2,186,900	87,253,924
1900–1904	6,810,310	7,562,030	4,271,508	2,487,568	701,390	.....	2,193,092	108,751,570
1905–1909	8,517,892	7,717,198	6,010,832	1,737,502	409,836	.....	2,302,200	147,182,308

CHANGES IN POPULATION AND MILK RECEIPTS OF NEW YORK CITY.

In 1886, 5,500,000 forty-quart cans of milk and cream were received in New York City. In 1911 this amount had increased to over 18,000,000, or an increase of 200 per cent in 25 years. In 1880 the population of New York City was 1,800,000; in 1890, 2,500,000, and in 1910, 4,800,000. It is evident, therefore, that the increase in population has not been as rapid as the increase in milk receipts. In other words, apparently there has been an increase in the per capita consumption. The quantity of milk received in New York in 1910 would make 50,000,000 pounds of butter, or 130,000,000 pounds of cheese, while the receipts in 1890 would make 19,500,000 pounds of butter, or 52,000,000 pounds of cheese; thus the increase for these 20 years in the milk received in New York City would be equivalent to 30,000,000 pounds of butter, or 78,000,000 pounds of cheese. According to the census for these years the actual decrease in production for New York State was 42,000,000 pounds of butter and 19,000,000 pounds of cheese, and in Pennsylvania, 5,000,000 pounds of butter and 7,000,000 pounds of cheese; or for the two States the decrease in production in the twenty years amounted to 47,000,000 pounds for butter and 26,000,000 pounds for cheese. Therefore New York City has not been the only factor in decreasing the butter and cheese production, but the demand of other cities for market milk has caused a decrease in this production equivalent to about 100,000,000 gallons.

INFLUENCE OF MARKET MILK UPON BUTTER AND CHEESE PRODUCTION.

Thus we see that prior to 1890 most of the railroad milk consumed in New York came from counties on the eastern bank of the Hudson River and Orange and Sullivan Counties on the west. After 1890

the railroads reached out into the counties where butter and cheese manufacturing had become prominent. In order to determine what was the influence of this competition of market milk with the milk for butter and cheese production, a detailed study of the changes in a few counties might be of value. In the counties where milk shipment began early, as in Westchester, Putnam, Dutchess, and Columbia, butter and cheese production on farms never became important, and in recent years a decreasing percentage of the total milk produced has been used for the production of butter and cheese, either on the farm or in the factory. Although there was a tendency for the number of cows to increase between 1880 and 1890, in most instances the number has been decreasing in recent years.

Delaware County is a county in which the introduction of butter and cheese factories and the shipping of market milk took place at about the same time. In 1890, 6,600,000 pounds of butter was produced on farms; in 10 years it decreased to 6,000,000, and the factory production amounted to 2,000,000. In 1910 the farm production was less than 1,000,000 pounds, and the factory production had increased so that in some years it amounted to over 5,000,000 pounds. In the meantime milk received by the condenseries and milk-shipping stations had reached nearly 25,000,000 gallons annually. The number of dairy cows in Delaware County continues to increase. In 1860 there were over 38,000; in 1880, 58,000; in 1910, 78,000.

Herkimer and Chenango are counties where factory-cheese production became established early in its development, and market milk did not begin to compete until after 1890. Here, also, is found a marked decrease in the production of farm butter, and apparently a slight decline in the manufacture of butter and cheese, but the amount of milk received by milk-shipping stations continues to rise. The number of dairy cows reached it maximum in 1880 and shows a decline since that census.

Although New York is the only State in the North Atlantic group which showed an increase in dairy cows in 1910 over 1900, the increase was very slight and due primarily to the spreading of the dairy industry into areas formerly prominent for their grain production. For the State as a whole, the most marked change in the dairy industry was a decrease of farm-made butter from 75,000,000 pounds to 23,000,000 pounds, while there was an increase of only a little over 5,000,000 pounds in factory-made butter. The decrease in cheese production amounted to 25,000,000 pounds. Consequently a large part of the milk formerly used to produce butter and cheese on farms is now sold to be consumed raw.

MILK SUPPLY OF BOSTON.

Prior to 1870 all of the milk consumed in Boston came from a distance of not more than 65 miles. By 1890 the Boston & Maine Railroad was bringing milk from a distance of 150 miles, and in 1910, 275

miles. Prior to 1900 all of the milk for Boston carried over the New York, New Haven & Hartford Railroad came from stations within 34 miles of the city. But the demand increased so that the farthest shipping points were 85 miles distant in 1900 and 210 in 1910. Several of the shipping points for Boston are in regions from which milk is shipped to New York City also, and therefore these two cities are competitors at these points.

MILK SUPPLY OF PHILADELPHIA.

Prior to 1870, Philadelphia was receiving its milk from an area within a radius of 50 miles of the city, and the greater part of the milk received was transported by railroads. Prior to 1910 the farthest points on the Pennsylvania Railroad system from which milk was shipped to Philadelphia were near Harrisburg and Reading, in Pennsylvania, and Milford, Princeton, Hightstown, Bridgeton, and Salem, in New Jersey. But in 1911 the area was extended until it reached to points in New York State within a few miles of Buffalo. The Reading system in 1910 was drawing its milk for Philadelphia over practically as large an area as was the Pennsylvania Railroad system.

TABLE 7.—*Number of quarts of milk received at Philadelphia, 1890–1911.*

Year.	Pennsylvania R. R. system.	Philadelphia & Reading R. R.	Baltimore & Ohio R. R.	Wagons (estimated).
	Quarts.	*Quarts.*	*Quarts.*	*Quarts.*
1900	39,820,550	39,490,498	6,029,436	7,200,000
1901	42,041,944	37,586,960	6,268,120	7,200,000
1902	44,295,196	36,836,840	6,502,916	7,200,000
1903	47,984,643	38,842,186	7,015,284	7,200,000
1904	49,777,425	39,064,700	6,986,160	6,000,000
1905	51,438,909	41,686,952	7,640,540	6,000,000
1906	54,974,613	49,534,862	9,440,360	6,000,000
1907	56,284,822	53,399,354	11,022,260	6,000,000
1908	58,513,720	55,434,606	11,285,260	6,000,000
1909	62,678,151	52,746,857	13,319,444	6,000,000
1910				
1911	67,883,718	62,212,211	12,788,504	4,800,000
Averages:				
1890–1894	37,716,398	36,570,061	5,743,388	10,260,000
1895–1899	38,413,831	35,063,470	6,275,870	8,280,000
1900–1904	44,783,952	38,364,237	6,560,383	6,960,000
1905–1909	56,778,043	50,560,526	10,541,573	6,000,000

Year.	Trolley lines at 63d and Market Streets.	Lehigh Valley R. R. via Philadelphia & Reading.[1]	Adams Express Co.	United States Express Co.	Total.
	Quarts.	*Quarts.*	*Quarts.*	*Quarts.*	*Quarts.*
1900		10,015,824			102,556,308
1901		10,340,320			103,437,344
1902		9,885,190			104,720,142
1903		10,200,920			111,243,033
1904		10,069,080			111,897,365
1905	3,818,829	9,815,740			120,400,970
1906	4,120,597	5,580,950			129,651,382
1907	4,378,952	898,600	3,157,560	789,640	135,931,188
1908	5,667,660		2,629,510	832,240	140,362,996
1909	6,899,821		3,697,770	652,820	145,994,863
1910					
1911	9,098,066		5,290,520	427,560	162,500,579
Averages:					
1890–1894		2,152,200			92,442,047
1895–1899		8,158,288			96,191,459
1900–1904		10,102,267			106,770,838
1905–1909	4,977,172	3,259,058	1,896,968	454,940	134,468,280

[1] Originating at stations on the Lehigh Valley Railroad and forwarded to Philadelphia over the Philadelphia & Reading Railroad.

FLUCTUATIONS IN PRICES OF BUTTER AND OF MARKET MILK.

By comparing the prices for milk with those paid for butter on the same market, somewhat of a line of the influence of one upon the other can be obtained. By comparing the wholesale prices of milk and butter on the New York market for the last 35 years, it is noted that in only three years has there been a rise or a drop in the price of one without an accompanying change in the price of the other. In the three years mentioned, the price of butter dropped, but the price of milk did not. When a comparison is made of the number of quarts of milk it would require for a pound of butter, it is found that for the five years prior to 1895 it took 9.31 quarts to buy 1 pound of butter, and for the five years prior to 1910, 8.4 quarts. Even this is 0.15 below the average for 1885–1889, the lowest period being between 1875 and 1895. It was about 1890 that the North Atlantic States were not producing as much butter as they were consuming, and the price began to rise. To obtain milk for consumption raw, milkmen had to pay above the factory prices, so that it took fewer quarts of milk to buy a pound of butter.

TABLE 8.—*Prices of milk and butter in New York City.*

Year.	Average price of—		Amount of milk equal in value to 1 pound of butter.
	Butter.	Milk.	
	Cents.	*Cents.*	*Quarts.*
1901	21.6	2.62	8.24
1902	24.8	2.88	8.61
1903	23.48	2.88	8.15
1904	21.75	2.75	7.91
1905	24.64	2.89	8.53
1906	24.67	3.01	8.20
1907	28.14	3.35	8.40
1908	27.00	3.29	8.21
1909	29.21	3.38	8.64
1910	30.13	3.68	8.19
1911	26.77	3.36	7.97
1912	31.38	3.68	8.53
Average:			
1865–1869	38.94	5.12	7.61
1870–1874	32.96	4.04	8.16
1875–1879	27.56	3.03	9.10
1880–1884	27.70	3.07	9.02
1885–1889	23.62	2.76	8.56
1890–1894	24.94	2.68	9.31
1895–1899	19.86	2.42	8.21
1900–1904	22.81	2.77	8.23
1905–1909	26.73	3.18	8.41

CHICAGO'S RECEIPTS AND SHIPMENTS OF BUTTER.

Prior to 1875 the receipts of butter at Chicago were less than 40,000,000 pounds. The average receipts for 1890 to 1894 were 136,000,000 pounds, and 15 years later this quantity had more than doubled. A small proportion of this butter was consumed within the city.

Prior to 1875, shipments of butter amounted to less than 20,000,000 pounds, but in the next five years they had reached 35,000,000 pounds and in 1911, 285,000,000 pounds. Of the 1910 shipments 75 per cent were forwarded over "eastern lines" and, presumably, were consumed in the North Atlantic States. In 1911 the shipments of butter over "eastern lines" exceeded the entire farm and factory production in the North Atlantic States.

TABLE 9.—*Receipts and shipments of butter at Chicago, 1870–1911.*

Year.	Receipts.			
	Chicago & North Western Ry.	Illinois Central Ry.	Chicago, Rock Island & Pacific Ry.	Chicago, Burlington & Quincy R. R.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
1900	72,341,368	15,091,300	16,945,148	17,042,055
1901	67,504,965	16,157,000	12,953,692	22,440,240
1902	70,756,785	15,545,900	9,630,909	21,511,390
1903	74,394,032	14,512,200	14,839,751	19,697,800
1904	74,163,297	18,707,620	20,605,673	18,529,708
1905	77,386,276	20,039,400	40,318,260	23,272,195
1906	62,352,403	23,682,800	33,802,475	33,694,683
1907	71,327,391	22,968,265	27,794,396	47,907,105
1908	82,140,322	19,774,100	28,995,256	65,287,598
1909	79,079,399	19,419,500	17,426,093	57,144,541
1910	105,892,369	16,818,200	19,870,309	57,429,012
1911	106,174,300	10,652,300	20,675,900	58,418,200
Average:				
1870–1874	5,980,855	.....	1,596,560	5,047,724
1875–1879	14,830,358	6,705,835	2,355,528	6,055,937
1880–1884	20,859,824	11,512,078	8,596,308	7,557,451
1885–1889	34,987,966	14,630,295	13,680,105	12,810,383
1890–1894	35,601,770	12,574,276	21,772,140	12,145,476
1895–1899	67,707,672	16,332,074	30,992,093	20,027,476
1900–1904	71,832,089	16,002,804	14,995,035	19,844,239
1905–1909	74,457,158	21,176,813	29,667,296	45,461,224

Year.	Receipts.			Total shipments.
	Chicago, Milwaukee, & St. Paul Ry.	Other routes.	Total.	
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*
1900	89,586,700	33,378,619	244,385,190	208,536,699
1901	98,205,060	36,548,286	253,809,243	245,488,028
1902	65,649,800	36,137,758	219,232,542	201,787,285
1903	63,108,400	45,480,301	232,032,484	197,620,859
1904	62,446,200	48,671,648	243,124,146	249,359,694
1905	65,252,973	45,645,699	271,914,803	254,130,889
1906	48,679,084	46,436,653	248,648,098	252,807,516
1907	47,947,342	45,770,143	263,714,642	252,005,932
1908	74,041,760	46,455,746	316,694,782	269,178,313
1909	71,048,129	40,429,173	284,546,835	235,648,837
1910	71,490,137	47,485,473	318,985,500	266,288,900
1911	64,326,100	74,685,600	334,932,400	285,685,400
Average:				
1870–1874	.....	.....	.....	.....
1875–1879	7,510,102	2,702,835	40,160,595	37,234,087
1880–1884	21,493,212	1,842,147	71,861,020	68,644,705
1885–1889	30,302,740	7,093,265	113,504,754	114,995,773
1890–1894	38,901,702	15,449,152	136,444,516	148,425,031
1895–1899	75,910,798	9,532,719	220,502,832	200,973,969
1900–1904	75,799,232	40,043,322	238,516,721	220,558,513
1905–1909	61,393,858	44,947,483	277,103,832	252,754,297

RECEIPTS OF BUTTER AT NEW YORK CITY.

The receipts of butter at New York City amounted to 75,000,000 pounds in 1880 and increased to 125,000,000 in 1910. At the earlier date the shipments east of Chicago amounted to less than 60,000,000 pounds, so that New York City could not have been entirely dependent upon butter shipped from Chicago. However, in 1911 there were shipped east 240,000,000 pounds, or nearly twice the amount received at New York. Therefore, it is readily seen that western butter must go into other eastern markets as well as New York City.

Taking the difference between the average per capita production for the United States as a whole and the average per capita consumption, the North Atlantic States would show a deficit of nearly 200,000,000 pounds; while the North Central States would have a surplus of 325,000,000 pounds; so it will be seen that the latter group supplies the deficit, not only for the Northern Atlantic States, but also for other parts of the country.

SPECIAL STUDY OF CONSUMPTION OF MILK AND BUTTER.

QUANTITY OF MILK USED ON FARMS.

A circular letter was sent to correspondents of the Bureau of Crop Estimates asking for the number of persons in a household and the average daily consumption of milk and of butter. Replies to this letter indicated that the average person in a farm household consumes about three-fourths of a quart of milk per day. This includes milk used for cooking, as well as that consumed raw or used with tea or coffee. The average household of the farmer was found to be 5.3 persons, so that altogether they consumed over 4 quarts per day. If the average consumption per farm for the year is multiplied by the total number of farms reporting dairy cows it shows that nearly 8,000,000,000 quarts of milk are used on farms for consumption raw. This amount nearly equals the quantity received by butter, cheese factories, and condenseries.

TABLE 10.—*Milk consumption on farms.*

Geographic division.	Average number of members per household.	Average milk consumed—		Farms reporting dairy cows.	Estimated total milk consumption on farms.
		Per household per year.	Per capita per year.		
		Quarts.	*Quarts.*	*Number.*	*Quarts.*
New England	5.3	1,425	271	147,028	209,514,900
Middle Atlantic	4.6	1,059	231	400,473	424,100,907
East North Central	4.7	1,111	238	1,009,479	1,121,531,169
West North Central	5.4	1,436	267	989,135	1,420,397,860
South Atlantic	5.3	1,568	297	794,716	1,246,114,688
East South Central	5.5	1,780	326	815,423	1,451,452,940
West South Central	5.9	1,862	317	724,466	1,348,955,692
Mountain	6.2	1,986	319	120,328	238,971,458
Pacific	4.9	1,364	276	139,821	190,715,844
Total, United States	5.3	1,488	288	5,140,869	7,651,755,458

BUTTER CONSUMPTION ON FARMS.

Returns from this inquiry also indicate that the average person on the farm consumed a pound of butter every 10 days, or that the average farm family consumed over a half pound per day. If this average per family for the year be multiplied by the total number of farms reporting butter production, it would equal nearly 900,000,000 pounds. An additional question was asked of those correspondents who made butter, namely, "How many quarts of milk does it require to make a pound of butter?" The average for the United States was 9.6 quarts; varying from 8.1 for the West South Central States to 10.7 for the West North Central. If the total sales of butter by farmers is added to the total home consumption as obtained above, and the result multiplied by the average number of quarts of milk necessary to produce a pound of butter, it shows that farmers use at home, for butter, over 12,000,000,000 quarts of milk annually, or over 40 per cent more than was reported by butter and cheese factories and condenseries to the Thirteenth Census.

TABLE 11.—*Butter consumption on farms.*

Geographic division.	Average number of members per household.	Average butter consumed.		Farms reporting butter production.	Estimated total consumption on farms.
		Per household per year.	Per capita per year.		
		Pounds.	*Pounds.*	*Number.*	*Pounds.*
New England	5.3	160	30	94,858	15,177,280
Middle Atlantic	4.6	182	40	267,085	48,609,470
East North Central	4.7	176	38	802,909	141,311,984
West North Central	5.4	210	39	841,084	176,627,640
South Atlantic	5.3	181	34	772,972	139,907,932
East South Central	5.5	190	35	820,015	155,802,850
West South Central	5.9	214	36	705,549	150,987,486
Mountain	6.2	222	36	101,777	22,594,494
Pacific	5.0	158	32	109,036	17,227,688
Total, United States	5.3	192	36	4,515,285	868,246,824

TABLE 12.—*Consumption of milk in cities.*

Geographic division.	Cities of 25,000 and over.		Cities of 2,500 and over.	
	Yearly per capita consumption.	Estimated total consumption.	Yearly per capita consumption.	Estimated total consumption.
	Gallons.	*Gallons.*	*Gallons.*	*Gallons.*
New England	35.709	115,874,669	35.794	195,268,619
Middle Atlantic	33.854	362,598,650	33.270	456,576,620
East North Central	29.379	185,551,154	25.397	244,249,832
West North Central	20.030	47,623,108	20.888	80,914,180
South Atlantic	21.428	40,379,095	20.677	63,936,448
East South Central	18.656	16,554,719	18.590	29,264,917
West South Central	17.529	17,106,358	17.519	34,292,672
Mountain	24.974	11,097,846	22.369	21,194,874
Pacific	31.781	54,116,115	31.151	74,211,931
Total, United States	29.810	850,901,714	28.151	1,199,910,093

QUANTITY OF MILK CONSUMED IN CITIES.

An inquiry was addressed to the boards of health in all the cities of 2,500 inhabitants or over, asking the average daily receipts of milk in January, April, July, and October. Replies to this inquiry indicates that the average per capita consumption was 28 gallons, or 112 quarts per year; hence the average person in a city consumed less than one-third of a quart of milk per day. The average farm consumption was 288 quarts in the year. If the average per capita yearly consumption is multiplied by the total city population, it shows that cities require 1,000,000,000 gallons per year. Another interesting result shown by these returns was that the consumption was slightly higher in cities of 25,000 inhabitants or over than in smaller cities.

The returns regarding the variation in milk consumption by months were not entirely satisfactory, but seem to indicate that the receipts at the large cities fluctuate less than those of the smaller ones. The fluctuations were generally less than 10 per cent.

MILK CONSUMPTION IN SMALL TOWNS.

Since no data are available to show the consumption in small cities or villages, or on farms not having dairy cows, the total consumption can not be accurately estimated. If the average per capita consumption of milk in the cities of 2,500 or over is applied to the population not on dairy farms, but considered as rural, it would require 600,000,000 gallons per year. If this is added to the quantity of milk received by the butter and cheese factories and condenseries, the quantity required to produce butter and cheese on farms, the quantity used for consumption raw upon farms, and the quantity consumed by cities of 2,500 or over, it would approximate 9,000,000,000 gallons. Of course a large quantity of milk is used for feeding calves in addition. If this total consumption is divided by the total number of dairy cows, whether on farms or not, an average annual production would be obtained of over 400 gallons per cow. The average production, according to the census of 1910, for those cows on farms for which milk production was reported was only 362.

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